VII. THE APPLICATION TO HOT GASES OF THE THEORY OF HYDRAULIC FLOW OVER THICK-CRESTED WEIRS.

In a large reservoir from which there is a flow over a weir of Q cu m of water per second there will be established at a constant height H above the sill of the weir, a water surface which supplies the hydraulic gradient necessary for the flow (Fig. 24). The

FIG. 24.

depth of the water flowing over the weir will be determined by the formula:

There is also the formula

$$Q = 0.356\ V2gH^{*},$$

from which

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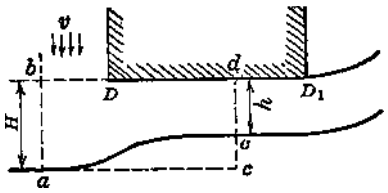
in which b signifies the length of the weir.

This formula makes possible the determination of the depth of the channel connecting two basins of water, and



applies equally to the depth of all streams whose bed presents a grade sufficient to compensate for the inevitable friction losses of flow.

Each reverberatory furnace having a horizontal roof forms the bed of an inverted stream, FIG. 25. in which there flows, not water, but hot gases (Fig. 25). Reverberatory furnaces, in order that they may function properly, must be so designed as to take account of the following facts:

All of the material which is to be reheated in the furnace is placed upon its hearth. Much heat will be lost in the reheating of this material, as well as by radiation from the walls. The